

Claims

1. A method of measuring mass flow of a first gas component in a gas consisting of one or more known gas components, which gas flows in a pipe
5 in which one or more measurement devices (440, 450, 460, 461, 462, 465; 540, 550, 560, 561, 562, 565; 635, 640, 660, 661, 662, 665) is/are arranged in connection with the pipe, said method comprising the following steps:

- 10 - determination of one or more gas parameters of the gas by means of the measurement device(s) (440, 450, 460, 461, 462, 465; 540, 550, 560, 561, 562, 565; 635, 640, 660, 661, 662, 665),
- determination of the mass flow of the one gas component by means of the determination of the one or more gas parameters,

15 **characterised in**

that the determination of the one or more gas parameters comprises a continuous determination of all of those of the gas parameters that are used in the determination of the mass flow of the first gas component and which
20 may vary considerable as a function of the gas composition, pressure and/or temperature.

2. A method according to claim 1, **characterised in** that in connection with the pipe a tubular body (410; 510; 610) is incorporated, which is surrounded
25 by an insulating material (430; 530; 630), and wherein the method further comprises the following steps:

- supply of a given amount of energy E to the gas in the tubular body (410; 510; 610).

30 3. A method according to claim 2, **characterised in** that the measurement device(s) (440, 450, 460, 461, 462, 465; 540, 550, 560, 561, 562, 565; 635,

640, 660, 661, 662, 665), that are used for determining the one or more gas parameters comprise a volume percentage measurement instrument (440; 540; 640) and two temperature measurement instruments (460, 465; 560, 565; 660, 665), wherein the volume percentage measurement instrument
5 (440; 540; 640) is arranged in or in immediate vicinity of the tubular body (410; 510; 610) and wherein the one temperature measurement instrument (460; 560; 660) is arranged at the inlet of the tubular body (410; 510; 610) and the second temperature measurement instrument (465; 565; 665) is arranged at the outlet of the tubular body (410; 510; 610).

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4. A method according to claim 2 or 3, **characterised in** that the step of determination of one or more gas parameters by means of measurement devices comprise:

- determination of the gas temperature T_1 at the inlet of the tubular
15 body; and
- determination of the gas temperature T_2 at the outlet of the tubular body.

5. A method according to any one of claims 2 through 4, **characterised in**
20 that those of the gas parameters that are determined continuously and that partake in the determination of the mass flow consist of the gas composition and the gas temperature T_1 at the inlet of the tubular body and the gas temperature T_2 at the outlet of the tubular body.

25 6. A method according to claim 1, **characterised in** that the measurement devices comprise a pressure differential measuring instrument (450; 550; 640) and a volume percentage measurement instrument (440; 540; 640); and in that those of the gas parameters that are determined continuously and partake in the determination of the mass flow of the first gas component
30 comprise pressure differential across a restriction and the volume percentage of the first gas component.

7. A method according to claim 6, **characterised in** that the measurement devices moreover comprise a temperature measuring instrument (460, 461, 462, 465; 560, 561, 562, 565; 660, 661, 662, 665) and that those of the gas parameters that are determined continually and partake in the determination
5 of the mass flow of the first gas component moreover comprise the gas temperature.

8. A method according to claim 6 or 7, **characterised in** that those of the gas parameters that are determined continually and partake in the determination
10 of the mass flow comprise the gas density.

9. A method according to claim 1, **characterised in** that the measurement devices comprise a hotwire and a volume percentage measurement instrument.
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10. A method according to claim 9, **characterised in** that the measurement devices also comprise a temperature measurement instrument.

11. A method according to claim 9 or 10, **characterised in** that those of the
20 gas parameters that are determined continuously and partake in the determination of the mass flow comprise one or more of the following: the viscosity of the gas, the heat capacity of the gas, the heat conductivity of the gas, the density of the gas, and the temperature of the gas, the volume percentage of the first gas component.

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12. Use of the method according to any one of claims 1 through 11 for the determination of the mass flow of a first gas component being in saturation state.

30 13. Use of the method according to claim 12, wherein the first gas component being in saturation state is water vapour.

14. Use of the method according to any one of claims 1 through 11 for the determination of the mass flow of a first gas component in a biogas.
- 5 15. A mass flow measurement device for measuring a first gas component in a gas consisting of one or more known gas components, wherein the mass flow measurement device performs the method according to any one of claims 1 through 11.
- 10 16. A mass flow measurement device according to claim 15, wherein the mass flow measurement device comprises a tubular body (410; 510; 610) surrounded by an insulating material (430; 530; 630), which tubular body (410; 510; 610) is configured for being connected to a pipe in which a gas flows, which tubular body (410; 510; 610) has an inlet (411; 511; 611) and an
- 15 outlet (412; 512; 612) for the flowing gas; means (420; 520; 620) for supplying energy to gas in the tubular body (410; 510; 610), a temperature measurement instrument (460; 560; 660) at the inlet of the tubular body (411; 511; 611), a temperature measurement instrument (465; 565; 665) at the outlet of the tubular body (412; 512; 612) and a volume percentage
- 20 measurement instrument (440; 540; 640).